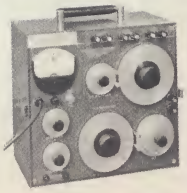
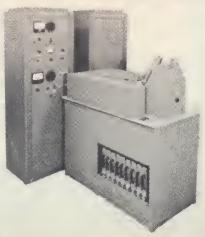


TEST & MEASURING INSTRUMENTS

INSULATION TEST EQUIPMENT

HIGH VOLTAGE POWER SUPPLIES

AMPLIFIERS



AUTOMATIC TEST EQUIPMENT

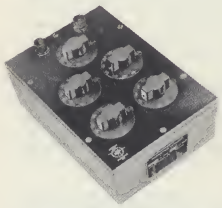
Industrial ®
Instruments

Industrial Instruments INC.
89 COMMERCE ROAD, CEDAR GROVE, NEW JERSEY 07009
201 CEnter 9-6200 TWX: 201 239-4704

Industrial Instruments INC.

TEST and MEASURING INSTRUMENTS

RESISTANCE DECADES Model DR Series



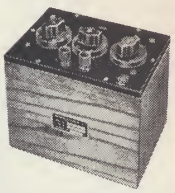
High-Precision and Stability • Low Zero-Resistance • Long-Life Switches.

DR units provide convenient selection of precise resistance values. Typical applications are found in the areas of circuit design in simulation of various factors, and as standards in bridge-type measurements.

Standard units are available with 3, 5, or 7-dials. Each decade inserts a precise ohmic resistance in series with the terminals. The basic ohmic value of any decade may be multiplied by factors of 0, 1, 2, 3, thru 10, by setting its dial at the appropriate step. Switches are 12 position, 360-degree type. Actual resistance is the sum of zero-resistance and indicated resistance. Model DR units provide zero-resistance of less than 0.003 ohm per decade.

Model No.	Maximum Resistance	Decade Steps
DR-1D	1,110,000	10 x (1K+10K+100K)
DR-2D	111,000	10 x (100+1K+10K)
DR-3D	11,100	10 x (10+100+1K)
DR-4D	1,110	10 x (1+10+100)
DR-50D	11,111	10 x (0.1+1+10+100+1K)
DR-51D	111,110	10 x (1+10+100+1K+10K)
DR-52D	1,111,100	10 x (10+100+1K+10K+100K)
DR-70D	1,111,111	10 x (0.1+1+10+100+1K+10K+100K)
DR-71D	11,111,110	10 x (1+10+100+1K+10K+100K+1M)

CAPACITANCE DECADES Model DK Series



Model DK units provide convenient selection of precise capacitance values with direct reading on the dials. Typical applications are found in bridge measurements and in experimental work such as circuit design. Standard units are 3-dial types. Paralleling switches provide steps of 0 to 10 by combinging four capacity values. All capacitance is connected across the terminals.

Capacitors are adjusted to the accuracies listed so that increments are correctly indicated on the dials. Zero-capacitance is less than 35 pf. Silver-mica and mylar dielectrics are used to obtain low-loss, high-stability characteristics.

Model	Maximum Capacity μf	Decade Steps μf	Accuracy	Power Factor	Peak Volts	Dielectric
DK-2A	1.11	0.001 10x 0.01 0.1	All ±1%	All 0.2%	700 700 500	All Silver Mica
DK-4	1.11	0.001 10x 0.01 0.1	±1% ±1% ±3%	0.2% 0.2% 1%	700 700 400	Silver Mica Silver Mica Mylar
DK-5A	11.1	0.01 10x 0.1 1.0	±1% ±3% ±3%	0.2% 1% 1%	700 400 400	Silver Mica Mylar Mylar
DK-11A	11.1	0.01 10x 0.1 1.0	±0.5% ±0.5% ±2%	0.2% 0.2% 1%	700 500 400	Silver Mica Silver Mica Mylar
DK-10	0.111	0.0001 10x 0.001 0.01	±10 μμf ±0.5% ±0.5%	2% 0.2% 0.2%	700 700 700	All Silver Mica

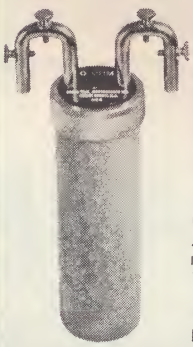
RESISTANCE CALIBRATOR Model CR Series

Enables the transfer of low resistance, high accuracy standard calibration resistors to high resistance ranges with only a slight transfer error resulting in extreme accuracies. Metal enclosure with binding posts designed to accommodate standard plugs, wire leads or spade lug terminals. Precision resistors mounted on materials which exhibit high volume and surface resistivity, zero moisture absorption, high arc resistance. Each calibrator furnished with two 24 inch test leads.

SPECIFICATIONS

Model No.	Number of Individual Resistors	Individual Value Each Res.	Resistance Range		Accuracy (Individual Resistors)	Transfer Accuracy	Resistor Type
			Series	Parallel			
CR-10M	10	1 Megohm	10 Megohms	100,000 Ohms	±.02%	±.001%	Oil Filled Epoxy Sealed Pad
CR-100M	10	10 Megohms	100 Megohms	1 Megohm	±.05%	±.01%	Oil Filled Epoxy Sealed Pad
CR-1000M	10	100 Megohms	1000 Megohms	10 Megohms	±.25%	±.02%	Metal Film Hermetically Sealed

RESISTOR STANDARDS N.B.S. Type



Designed for use as standards by research laboratories, standardization groups and educational institutions.

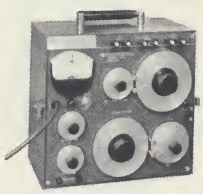
SR Series are precision engineered for applications requiring a reliable standard of resistance. The individual resistors are bifilar wound utilizing selected manganin wire. Particular attention is given to aging and stress relief to prolong permanency. Heavy leads permit series or parallel connection without departure from guaranteed limits. Entire immersion of resistor element in moisture free oil permits higher current rating and temperature equalization.

Connections:
4 terminal, current/potential type.

Error Limits:
Refer to table for limits of error under normal operating conditions.

Resistance Ohms	Type No.	Current Rating Amperes for ±0.01% Error Limit	Current Rating Amperes for ±0.04% Error Limit
1	SR-1	0.3	1.0
10	SR-10	0.1	0.3
100	SR-100	0.03	0.1
1,000	SR-1,000	0.01	0.03
10,000	SR-10,000	0.003	0.01

IMPEDANCE BRIDGE Model ZB Series

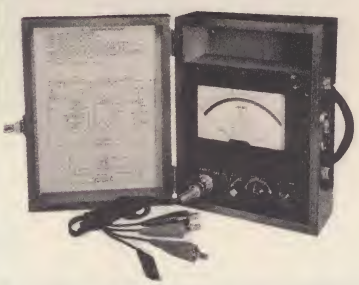


Model ZB-2 is a universal type bridge for the precise measurement of AC and DC Resistance, Inductance and Storage Factor, and Capacitance and Dissipation Factor. The instrument provides clear in-line readout, features simplified operation, and covers an exceptionally wide range for all types of measurements. In-line readings for DQ and RCL facilitate faster and more accurate reading. A new meter null detector is utilized on both AC and DC measurements to eliminate the conventional "electron-ray" or "eye" tube.

Range:	Resistance	0.0001 ohm to 11 megohms AC or DC (8 ranges)
	Capacitance	1 pf to 1100 μf (7 ranges)
	Inductance	1 μh to 1100 h (7 ranges)
	D	0.001 to 1.05 at 1 KC } Provision for
	Q	0.02 to 1000 at 1 KC } external extension
Accuracy:	Resistance	± (0.1% + 1 dial div.)
	Capacitance	± (0.2% + 1 dial div.)
	Inductance	± (0.3% + 1 dial div.)
	D Factor	± (5% + 0.0025)
	Q Factor to	10 HY ± (5% + 0.0025)
	at	100 HY ± (5% + 0.015)
	at	1000 HY ± (5% + 0.055)

Internal Oscillator Frequency: 1 KC ± 1%
Internal DC Supply: 10 V at 250 ma (DC Low)
200 V at 10 ma (DC High)

LOW RESISTANCE OHMMETERS Model LRO Series



Designed for the measurement of resistance of sensitive relay contacts, fuses, bus-bars and connections, rail joints, pipe or conduit, switch contacts, transformer windings, motor windings, bonding, grounding and similar applications. The current through the unknown resistance never exceeds 110 ma.

. Extreme accuracy for the most critical measurements Entirely self-contained, including 1½ V flashlight battery. Ranges: .1 ohm, 1 ohm and 10 ohms. 100 meter scale divisions. One scale division on .1 ohm range is .001 ohm. Accuracy of ±1½ or better on LRO-1 this accuracy is based on full scale values.

Industrial Instruments INC.

TEST and MEASURING INSTRUMENTS

DIGITAL VOLTMETER Model DVM-2

Significant design advancements are incorporated into the completely new Industrial Instruments Model DVM-2 Digital Voltmeter. For example, balancing speed is approximately twice that of conventional stepping-switch digital instruments. Long-life components have been meticulously selected and conservatively operated. The reed relays, for instance, will provide many millions of operations.

Easy to read? You bet! Read-out is furnished by premium long-life, wide angle Nixie tubes. And the DVM-2 is as quiet as analog-type VTVM's. Automatic range and polarity selection is provided. Plug-in circuits make this digital voltmeter a highly flexible instrument for bench or rack mounting. Check the specifications for yourself.

- **LOW COST**
- **FAST BALANCING**
- **HIGH RELIABILITY**
- **PLUG-IN CIRCUITRY**
- **AUTOMATIC RANGING AND POLARITY**

Measurements and ranges – DC Voltage from ± 0.001 to 999.9
0.000 to 9.999/99.99/999.9
Number of Digits – 4
Accuracy – ±0.01% of full scale + one digit
Range Changing – Automatic
Polarity Indication – Automatic
Balance Time – 0.4 sec. aver., 0.8 sec. max.
Input (Built-in 60 cycle noise filter)
Impedance – 10 Meg (All ranges)
Connection – AN type, 3 – wire

Circuitry – Printed wiring – plug-in boards
Switching – Reed relays with Beam – X* Tubes
Read-out – Nixie* tube long life, wide angle (0.6" character height)
Power Requirements – 115 volts ±10%, 60 cycles
Dimensions – 5¼" h x 19" w x 16" d
Weight – 31 lbs.

Registered Burroughs Corp. trademark

DIGITAL SCANNER Model DS Series

Reliable method of switching multiple signals to one measuring, recording or printing instrument to permit rapid monitoring of a number of measuring points. System uses dry reed switches and high speed transistor logic.

Electrical characteristics – lighted push button controls with switch functions; solid state circuitry (except Nixie indicator tubes) to operate from –20°C. to +55°C.; manual or remote control (except "Scan Limit Switches"); channel identification on Nixie indicators; scanner takes minimum of 2 milliseconds from leading edge of step command until scanner switching completed; can switch signals to 250 volts or 0.5 amps; capable of ganging reed switching relays in groups of 10 – programming arranged by internal patchboard; required input power is 115/230 V, 50-60 CPS.

Model	Number of Channels	Number of Levels
DS-100	100	2
DS-1000	1,000	2
DS-10000	10,000	2

WHEATSTONE BRIDGES Model RN Series

Universally used for the measurement of all types of resistance devices and circuits where high accuracy is required. Models available for performing Murray-Varley Loop tests.

Model	Total Resistance of Decade	Ratio Dial Settings	Circuits
RN-1	9X(1+10+100+1000)	.001, .01, .1, 1.0, 10, 100, 1000	.....
RN-2	9X(1+10+100+1000)	.001, .01, .1, 1.0, 10, 100, 1000, M10, M100, M1000	Murray & Varley
RN-3	10X(1+10+100)+9(1000)	1/1000, 1/100, 1/10, 1/9, 1/4, 1/1, 10/1, 100/1, 1000/1, M10, M100, M1000	Murray & Varley

DEVIATION BRIDGE Model DB-1 Series

Model DB-1 Deviation Bridge can be operated as either a balanced or unbalanced Wheatstone Bridge for rapid resistance comparisons. Prime application for this instrument lies in production and incoming inspection of resistors. The Model DB-1 can be used to indicate percentage deviation from an internal standard; comparison of resistors to a sample resistor; matching pairs of resistors; and for general resistance measurements by the null method.

The instrument uses a DC Bridge to avoid inductive and capacitive effects. The built-in standard consists of seven decades of resistance adjustable from 1 ohm to 1,111,111 ohms in 0.1 ohm steps. Provisions are made for external standards, when required, and for using the built-in decade steps for external laboratory measurements.

Four ranges of full scale deflection are provided: ±20%, ±5%, ±2% and ±1%. The Model DB-1 has an accuracy of ±0.1% as a limit bridge and greater accuracy as a null device. The voltage applied to the unknown is nominally 1 volt and will vary from 0.89 to 1.1 volts as the deviation varies from –20% to +20%.

KILOVOLTMETERS 100,000 Volts AC or DC

Rugged 6 inch precision mirror, scale meter with stabilized anti-drift transistorized circuitry. Plug-in or self contained long life mercury battery power supply. Panel mounted trimmers for recalibration; fast spike bypass circuitry and new automatic voltage coefficient compensator for the multipliers plus special high voltage probes. Probe accuracy is ±2% on 5-10KV range and ±4% on 50-100KV range. Ideal for use in field or lab testing.

Ranges: 0 to 5,000/10,000/50,000/100,000 volts DC or 60 cycles AC.
Model 60 – DC only Model 50 – AC or DC
Model 40 Precision Standard Divider available as accessory in place of regular probe. Accuracy ±0.1%.

Industrial Instruments ®

Industrial Instruments INC.

89 Commerce Road, Cedar Grove,
Essex County, N. J.

Industrial Instruments INC.

INSULATION TEST EQUIPMENT

AC BREAKDOWN TESTERS Model PA Series

Type PA variable high voltage AC breakdown testers are designed to meet the requirements of ASTM specification D-149, and Federal specification LP-406, Method 4031, as well as all general purpose breakdown testing. Provided with motor-driven control of output voltage with any desired rise of secondary voltage. Available with wide variety of testing jigs.

PA-5-152	15,000 V. rms. 2KVA
PA-5-155	15,000 V. rms. 5KVA
PA-5-252	25,000 V. rms. 2KVA
PA-5-255	25,000 V. rms. 5KVA
PA-5-502	50,000 V. rms. 2KVA
PA-5-505	50,000 V. rms. 5KVA
PA-50-1005	100,000 V. rms. 5KVA

For even greater versatility, dual range units using multiple winding transformers are available on order. These provide two meters and a total of six scales. Typical dual-range models as follows:

PA-5-252/052	25 kv or 5 kv rms. 2KVA
PA-5-502/102	50 kv or 10 kv rms. 2KVA
PA-50-5010/1510/510	50 kv or 15 kv or 5 kv rms. 10KVA

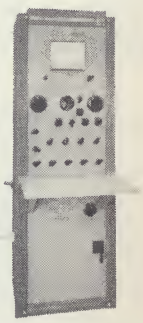
ARC-RESISTANCE TESTERS Model ART Series

Model ART series arc resistance tester is supplied in conformance with ASTM Spec. D-495-56T and Federal Spec. LP-406, Method 4011.2. Unit is employed for the measurement of insulating materials ability to withstand high voltage, low current arcs.

The Model ART-1 has the following steps: 10/8, 10/4, 10/2, 10, 20, 30, and 40. The 10/8 means that a 10 ma arc is applied for ⅛ of a 2 second cycle in one ¼ second period. The 10/4 means that a 10 ma arc is applied for ¼ of a 2 second cycle in two ¼ second periods, etc. The 10, 20, 30, and 40 ma arcs are sustained for 60 seconds. The stepping is automatic at one-minute intervals. On manual operation all steps are available for any time duration.

Model ART-2 provides additional arc intensities of 60, 80, and 100 ma. It also includes metering facility for the volts after tracking measurement.

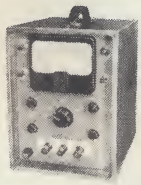
HIGH-VOLTAGE SCHERING BRIDGE Model PS Series



Used to measure dissipation and capacitance of electric insulating material while subjected to high-voltage stress. From these two measured values and the dimensions of the sample and test electrodes, dielectric constant, loss factor, and other values may be calculated.

Exceptionally wide capacitance range—Model PS-1GP general purpose bridge from 0.0000025 to 1.0 mfd. Model PS-1C cable bridge from 0.0000025 to 2.0 mfd • Built-in shunts for testing large capacitances without additional equipment • High voltage operation . . . materials can be tested at operating value • Easy-to-operate . . . all controls located on front panel. Few calculations required • High accuracy . . . plus or minus 0.2% capacitance accuracy and 2.0% or better tangent accuracy • Compact design . . . general purpose bridge housed in one unit. Cable bridge housed in one unit with separate air capacitor and power supply.

WIDE-RANGE MEGOHMMETERS Model L Series

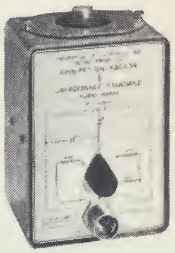


Designed for laboratory and high speed testing of motor and transformer winding insulation, cable insulation, high value resistors, capacitor insulation, and for the measurement of surface and volume leakage of insulating materials. Meets requirements for testing insulation resistance in accordance with ASTM D-257, and Federal Spec. LP-406B, Method 4041.

Model	TEST Voltage	RANGE Low	RANGE High	POWER Consumption	WEIGHT Net	WEIGHT Shipping	Size
L-2A	200 fixed	1 meg.	100,000 meg.	40 Watts	12	15	15″x8″x10″
L-4A	200 and 500 fixed	1 meg. 2.5 meg.	100,000 meg. 250,000 meg.	52 Watts	14	17	″
L-6B	100 to 600*	1 meg.	100,000 meg.	82 Watts	15	18	″
L-7	100 to 600*	1 meg.	$5x10^{13}$ ohms	75 Watts	20	24	8″x10½″x 11½″

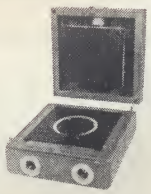
*Continuously variable, built-in voltmeter for accurate setting.

DISSIPATION FACTOR & CAPACITANCE STANDARD Model CPF-1



Used as the external checking standard in Schering Bridge operation. Usable up to 10KV. Consists of a vacuum capacitor and guard ring with a nominal capacitance of 100 $\mu\mu$f and three metal-film precision resistors of nominal values of 3.3K, 33K and 300K which can be selectively switched in series with the vacuum capacitor. The vacuum capacitor can also be used without series resistance.

NEW COMPLIANT ELECTRODE

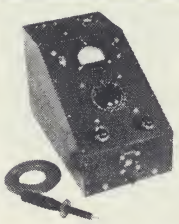


Model SVR-1 is a specialized electrode for measuring dielectric properties of materials. Especially suited for measurement of volume and surface resistivity. Developed to reduce errors encountered due to poor surface contact between conventional electrodes and test specimen.

DIELECTRIC TESTER Model DT-1

Model DT-1 conducts breakdown tests on electrical insulating materials—determines insulation properties of components and cable fault finding by high voltage Murry Loop method. Two-section tester consists of control unit and metering circuit and high voltage, oil-immersed rectifier section. Simplified operation provides consistent measurements. Precautions insure all possible operator safety.

SPECIFICATIONS: Output Voltage—Adjustable from 0.5 to 40 kilovolts; Output Current—3 ma at 40,000 volts, 13 ma at 20,000 volts, 18 ma at 10,000 volts; Circuit breaker—4.8 amperes rating; Output Polarity—Negative or positive; Capacitance of Rectifier Unit—0.05 microfarad; Internal Resistance of Rectifier Unit—Approx. 0.7 megohm; Ripple in Output—Less than 1% with 5 megohm resistive load; Kilovoltmeter Ranges—0-5Kv, 0-10 Kv, 0-25 Kv, 0-50 Kv.



VOLTAGE BREAKDOWN TESTERS Model P Series

P Series Voltage Breakdown Testers are designed for safe, accurate and fast testing of materials, components and circuits both in the laboratory and on the production line. All types have self-contained metered high-voltage power supply with safety features including interlock switches and pilot warning lights. Load current is limited to values shown in table below. Output voltage continuously variable over range listed for each model.

Model	VOLTAGE RANGE AC volts RMS	VOLTAGE RANGE DC volts	CURRENT RANGE AC	CURRENT RANGE DC
P1	—	0-4000	—	5 ma (max)*
P2	0-3000	0-4000	7 ma (max)	5 ma (max)*
P3B	0-8000	0-10,000	60 ma (max)	50 ma (max)*
P-7-20	0-14,000	0-20,000	5-20 ma (variable)	5-15 ma** (variable)

*Models P1, P2, and P33 incorporate a variable series resistance which limits short circuit current independently of voltage.
**Model P-7-20 incorporates adjustable over-current cut-off.

CABLE FAULT FINDER PDI SERIES

Locates cable faults — no calculations needed: arc-over noise in detector headphone locates fault accurately in any length cable.

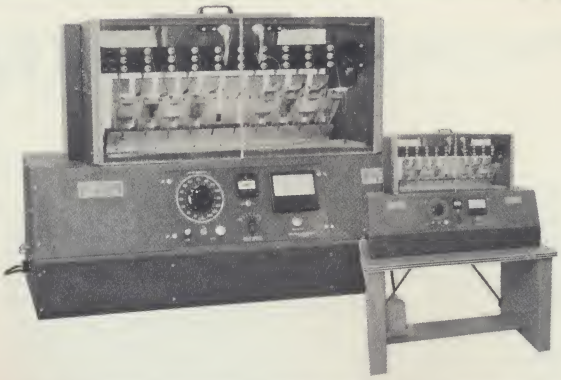
Two part Transmitter/Detector Finder consists of:

1. High voltage supply transmitter (PDI-15) with variable D-C output charging two capacitors (charging time approximately 3 seconds).
2. Portable amplifier detector unit (PDR-1) with pick-up probe, headphones and test connecting cables.

Industrial Instruments INC.

INSULATION TEST EQUIPMENT

TRACKING AND EROSION RESISTANCE TEST SET — TERT-1



Evaluates relative track and erosion resistance of various materials using Liquid Contamination Inclined Plane method described in ASTM and IEEE specifications. Test represents service exposure evaluation of wide range of insulated material subject to AC surface current. Test conditions simulate water film on insulation surface in which ionizable and other contaminants may dissolve. Contaminant rate easily controlled to simulate different service stresses and outside conditions. Tests conducted on 2″ x 5″ specimen; actual test covers 1″ x 2″ track area. Test criteria is either "time to track a fixed distance at a fixed voltage," or "voltage to initiate tracking"— depending on specific service requirement evaluation.

NEW CONVENIENCE FEATURES: (1) Large clear chamber for sample observation accommodates up to 10 testing stations. (2) Regulated power supply delivers test voltages up to 7.5 Kv. (3) Straight forward operation offers ease of set up and test control. (4) Separates all grades of insulating material.

DIELECTRIC BREAKDOWN TESTER Model PDA-1

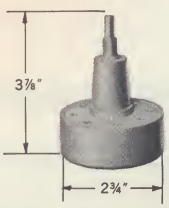
Designed to provide simple, safe, accurate means of determining dielectric strength and breakdown voltage in the laboratory or factory (conforms to requirements of ASTM specifications D-149 and Federal specification L-P-406 method 4031).

- Push button selection — four different leakage current meter ranges (six operating modes) — enclosed test cubicle, fail-safe circuitry, interlocked doors and oil immersed gravity-drop shorting switch allows safe use by unskilled personnel.
- Continuously adjustable (automatic or manual) test output voltage control uses full 100% rotation to allow fine control for critical testing (choice of AC or DC).
- Provides for transient suppression and introduction of non-linear resistance into transformer.
- Maximum versatility of test jig set-up using plug-in jigs or high voltage cable to external "hi-pot" testing circuits.
- Self contained unit — portable yet provides easy access to all parts for maintenance.

HIGH VOLTAGE SWITCHES

For high voltage, low current circuits requiring complete isolation; nominal rating 5,000 volts (DC or AC). Model A or D may be used in lower duty circuits to 10,000 volts DC. Steady state current rating 500 milliamperes — 5 Ma when switching. Isolated for 15,000 volts, DC test to ground . . . made of modified Diallyl Phthalate.

Model	TYPE
A	2 Pole reversible (for polarity reversing of power supplies)
B	D.P.D.T.
C	3 P.D.T.
D	4 Position (1 Gang)
E	6 Position (1 Gang)
F	8 Position (1 Gang)
G	10 Position (1 Gang)



INSULATION TEST SETS

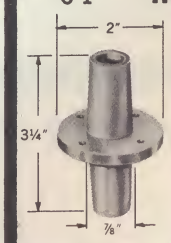
Used in testing insulation where AC voltages are desired. Dual instruments are also available which provide choice of AC or DC output. Includes kilovoltmeter, current meter and automatic overload limiter circuits. Metering accuracies are ± 3%. The basic model number covers AC types. Add the prefix AC/DC to the basic model number for the dual output type.

Model	VOLTAGES	VA
3000	0 to 3,000	75
3010	0 to 3,000	300
3050	0 to 3,000	1,500
3100	0 to 6,000	3,000
5000	0 to 5,000	75
1000	0 to 10,000	75
*1500-AC	0 to 15,000	75
*2500-AC	0 to 25,000	75
▪2500-DC	0 to 25,000	2.5
▪4000-DC	0 to 40,000	2.5

* Available AC only. ▪ Available DC only.

HIGH VOLTAGE CONNECTORS

C-1



Modified Diallyl Phthalate construction for superior arc resistance and low power factor; convenient miniature size with extra long air paths; sealed center conductor handles up to 20 amperes; neoprene gasket for mounting on oil filled tanks. For quick disconnect (easily mated with standard banana jack) or for permanent service with 10/32″ machine bolt; neat styling — available in 10 colors — ideal for mounting on front panels.

Model C-1 rated for 25,000 volts DC max.
Model C-0 rated for 5,000 volts DC.

C-0

PORTABLE HIGH VOLTAGE DC POWER SUPPLIES

MODEL	MAX. VOLTAGE
6000-1	1,000
6000	2,500
6005	5,000
6010	10,000
6015	15,000
6025	25,000

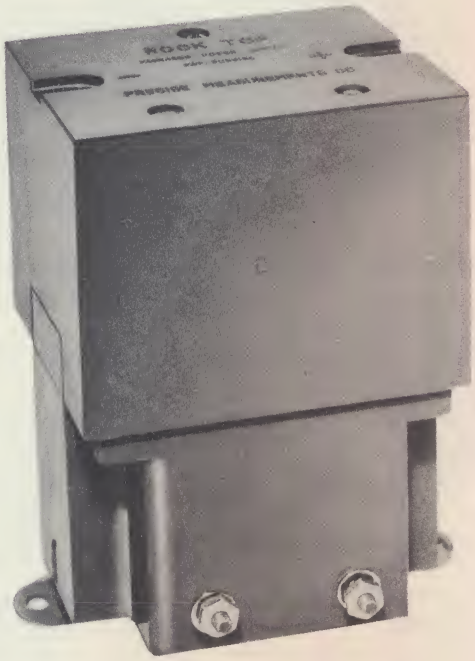
One of the most popular power supplies on the market. Completely redesigned for greater ruggedness and convenience of operation. Widely used for powering electronic equipment and for routine breakdown and insulation testing. Output voltage is well filtered D.C. which is adjustable with convenient front panel control. Input is 115 Volt, 60 cycle A.C. Larger 6″ precision 1 mirror scale movement available on order. Regulated models offer closely stabilized output voltage regardless of line or load changes.

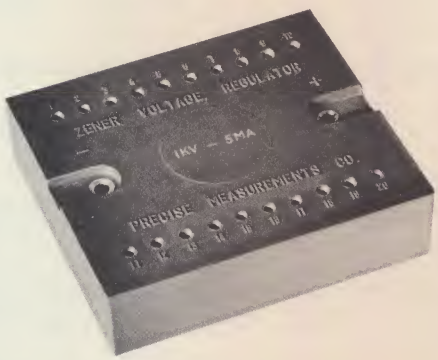
NOTE: Regulated power supplies are of the radio frequency type (RF) and adjust from appproximately 20 to full rated voltage. Regulation is in the order of ±1% over most of the range. These supplies are rated at 100 microamps. Transformer operated unregulated supplies are available in 1 and 5 milliampere types and have a range of zero to full voltage output. These are recommended for industrial service applications. When ordering add the proper prefix to the basic model number, for example, RF, 1 MA, or 5 MA, depending on your requirements.

Industrial Instruments INC.

HIGH VOLTAGE POWER SUPPLIES

PACKAGED POWER SUPPLIES





These new low-cost units make DC voltage problems easy. Just wire input and output connections, and the unit is ready to operate. Building block construction provides a basic transformer, a rectifier unit, and where necessary a regulating device. These three elements bolt together quickly and maintenance is simplified should any of the components fail. Each of the three basic building blocks are mechanically constructed in a molded Diallyl Phthalate shell and encapsulated with epoxy resin.

The output is completely isolated and either post may be grounded or the unit operated as a floating supply. The DC voltage is filtered and provides 5% or less ripple. Output may be varied from full rating down to zero by simply inserting a small adjustable transformer in the input. Most units are rated for 5 ma. current. Power supplies 7.5 KV and higher have modified mechanical construction from that described above. Input 115V, 60 cycle.

Use with High Voltage Zener Regulators to obtain 1% line and load regulation.

MODEL	OUTPUT VOLTAGE	MODEL	OUTPUT VOLTAGE
15-0-15-500MA	15-0-15 Volts	10-KV-5MA	10-KV-DC
30-0-30-100MA	30-0-30 Volts	15-KV-5MA	15-KV-DC
05-KV-5MA	500 Volts DC	20-KV-5MA	20-KV-DC
1-KV-5MA	1-KV-DC	30-KV-5MA	30-KV-DC
2-KV-5MA	2-KV-DC	*50-KV-5MA	50-KV-DC
3-KV-5MA	3-KV-DC	*75-KV-5MA	75-KV-DC
5-KV-5MA	5-KV-DC	*100-KV-5MA	100-KV-DC
7.5-KV-5MA	7.5-KV-DC		

* Oil-filled tank type construction

VOLT BOXES

Use these convenient reference standards or volt boxes for direct calibration of voltmeters, or use as a null type voltmeter by simple addition of a galvanometer. These standards consist of a Precise Resistive Voltage Divider with the input to the Divider regulated by means of a zener diode string. In order to maintain the high inherent accuracies, it is essential that the measurements be of the null type with no current flowing at the time of measurement. Each VZA STANDARD has twenty taps arranged in two rows. The bottom row is exactly 1/10 the voltage drop of the top row. Type VZ STANDARDS have just one known voltage (without taps), resulting in cost savings and is used for standard cell replacement. Precise Voltage Standards have several advantages over chemical cells, since they are completely solid state and can take voltage and current overloading without loss of accuracy. May be powered from batteries, external power packs or purchased complete with built-in power source. Several standards may be wired in series for higher voltages or finer adjustment. All reference standards listed have 1% accuracy. Higher accuracy types rated 0.1%, 0.01%, and 0.001% available at higher cost.

TYPE VZA STANDARDS

VOLT	MODEL	TAP VOLTS
1.000	VZA-1	.01 & .1
5.000	VZA-5	.05 & .5
10.00	VZA-10	.1 & 1
100.0	VZA-100	1 & 10
1,000	VZA-1K	10 & 100
2,000	VZA-2K	20 & 200
4,000	VZA-4K	40 & 400
5,000	VZA-5K	50 & 500

Industrial Instruments INC.

HIGH VOLTAGE POWER SUPPLIES

HEAVY DUTY POWER SUPPLIES

These industrial type power supplies are built for service and efficiency. All are of the transformer type and employ husky components that have been selected for their power handling capacity. Controls are arranged so that operation is simple and the units contain a number of safety features for protection of personnel and equipment. Output is continuously variable from zero to full rated values. These supplies are unregulated and standard ripple is 5% or less. Ripple of from 0.01% to 1%, and regulated supplies are available on special order. All power supplies have automatic overload cutout control circuits.

MODEL	VOLTAGE	CURRENT
F-100V	0-100	10 Amp.
F-500V	0-500	3 Amp.
F-6001	0-1000	2 Amp.
F-6002	0-2000	1 Amp.
F-6003-A1	0-3000	100 MA.
F-6003-AV	0-3000	500 MA.
F-6003-AK	0-3000	1 Amp.
F-6005-A1-H	0-5000	100 MA.
F-6005-AV	0-5000	500 MA.
F-6005-A1K	0-5000	1 Amp.
F-6010-A1	0-10,000	100 MA.
F-6010-AV	0-10,000	500 MA.
F-6020-A05	0-20,000	50 MA.
F-6030-A3	0-30,000	300 MA.
F-6050-T	0-50,000	½ MA.
F-6100-T	0-100,000	.1 MA.

CONSTANT CURRENT POWER SUPPLIES

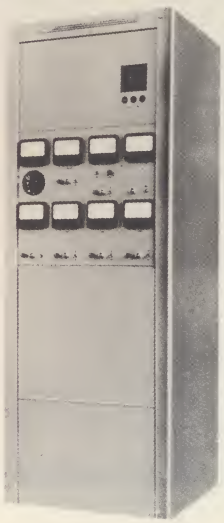
Designed for application where output current must remain constant regardless of loading resistance changes. Used for magnet fields, plating applications, gaseous lamps. Dependable magnetic current stabilizer has no moving parts, no tubes, no transistors to replace. Simply set current to desired level, no balancing or other adjustments needed. Ideal for lamp operation since operating state ionizing voltage in no way affects lamp current. Standard hum level 5%. Lower hum levels available on order.

MODEL	MAX. VOLTAGE	CURRENT
C-25-100	25 V.	100 Amp.
C-70-70	70 V.	70 Amp.
C-500-10	500 V.	10 Amp.
C-Dual-500-10	500 or 1000 V.	10 or 20 Amp.
C-1000-5	1000 V.	5 Amp.
C-3000-1	3000 V.	1 Amp.
C-5000-1	5000 V.	1 Amp.
C-10K-5H	10 KV	500 MA.

3 PHASE HEAVY DUTY POWER SUPPLIES

For use in applications where high voltages at extra high currents are required. Either fixed or fully variable types are available. Automatic circuits protect against over-current conditions, turning off main power in a split second. Used for plasma research, electron beam furnaces, plate power and condenser charging. Voltage or current regulated types available.

MODEL	VOLTAGE	CURRENT AMPS
A 1-A	0 to 100	100
A 1-B	0 to 100	1000
A 10A	0 to 1,000	5
A 10B	0 to 1,000	10
A 30A	0 to 3,000	5
A 31	0 to 3,000	10
A 32	0 to 3,000	20
A 50	0 to 5,000	5
A 51	0 to 5,000	10
A 72	0 to 7,500	10
A 100	0 to 10,000	5
A 110	0 to 10,000	10
A 200	0 to 20,000	5
A 300	0 to 30,000	5
A 500	0 to 50,000	5



Industrial Instruments INC.

89 Commerce Road, Cedar Grove, Essex County, N. J.

Phone: 201 CEnter 9-6200

Industrial Instruments INC.

AMPLIFIERS

EIGHT-CHANNEL TRANSISTOR AMPLIFIER Model 48

- LOW NOISE
- NON-MICROPHONIC
- PLUG-IN AMPLIFIERS
- VARIABLE GAIN CONTROL
- INTEGRAL SUPPLY REGULATOR

VOLTAGE GAIN	0-100 variable
FREQUENCY RESPONSE	±0.2 db 5 cps to 100,000 cps ±1.0 db 2 cps to 500,000 cps
INPUT IMPEDANCE	100,000 ohms shunted by 40 μμf
OUTPUT IMPEDANCE	600 ohms in series with 100 μf
EQUIVALENT INPUT NOISE	Broadband RMS noise for a 10,000 cps bandwidth anywhere between 10 cps and 100,000 cps as follows: 10μv for shorted input; 25μv for 10,000 ohm source; 75μv for 100,000 ohm source.
MAXIMUM INPUT	0.04 volts RMS @x100 gain 200 volts DC
MAXIMUM OUTPUT	4 volts RMS open circuit 1 volt into 1000 ohm load
DISTORTION	½% max. @1 volt output, open circuit, from 10 cps to 100,000 cps
OPERATING TEMPERATURE	+140°F. maximum
POWER REQUIREMENTS	Approximately 100 ma @+75 volts
DIMENSIONS	19″ wide x 3½″ high x 8″ deep
WEIGHT	9.5 lbs.

Model 48 Transistor Amplifier is designed for general systems instrumentation and offers an outstanding combination of performance characteristics, operating flexibility and reliability. It can be employed as a source of signal gain for several independent projects simultaneously, or as a preamplifier for multi-channel type recording devices.

The compact instrument housing requires only 3½ inches of panel height in a conventional rack mounting. Each amplifier is assembled as a separate plug-in module and can be removed if desired with minimum effort. Standard five-way binding posts with ¾ inch spacing are used at the input and output terminals. This spacing is also maintained between an amplifier output and the input of an adjacent amplifier. A shorted, dual banana plug can therefore be conveniently used for cascading stages in order to achieve higher gain. A zener regulator provided on each amplifier card serves to decouple it from the common power supply.

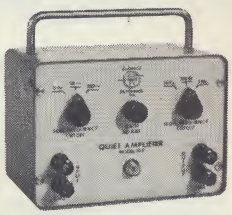
TRANSISTOR AMPLIFIER Model 45

The model 45 Transistor Amplifier offers the combination of a decade amplifier and continuously variable gain amplifier in a single package. The utility of this completely transistorized precision instrument can be appreciated in all phases of preamplifier service Its inherent low noise, freedom from microphonics, long operating life and compact size make it suitable for use in the laboratory or in the field.

A meter, located on the front panel, provides a continuous indication of internal battery supply life. The moderately high input impedance minimizes loading of the signal source. The low output impedance is suitable for driving many types of passive networks including octave band filters, transformers and galvanometers.

VOLTAGE GAIN	X1, X10, X100 or continuously variable
FREQUENCY RESPONSE	±0.5db 10 cps to 500 kcs −3db at 5 cps and 1 mcs
NOISE	50μv for X100 gain; 100μv for X10 gain; 500μv for X1 gain; broadband RMS referred to OPEN CIRCUIT input terminals
INPUT IMPEDANCE	Greater than 100,000 ohms shunted by 50μμf.
OUTPUT IMPEDANCE	600 ohms in series with 100μf.
DISTORTION	Less than 1% at 0.5 volt RMS into 5000 ohm load from 20 cps to 100 kcs
TIME STABILITY	Less than −0.5db gain change throughout entire battery life; 30 cps to 300 kcs
MAXIMUM INPUT	10 mv. for X100 gain; 100 mv. for X10 gain; 0.5 volt for X1 gain
MAXIMUM OUTPUT	1 volt RMS for X10 and X100 gain; 0.5 volt for X1 gain

QUIET AMPLIFIER Model 108



VOLTAGE GAIN	100, adjustable ±10%
FREQUENCY RESPONSE (wide band)	±0.2db, 10 cps to 200,000 cps ±0.5db, 5 cps to 500,000 cps −3db ±1db at 1 cps and 1 mcs
MAXIMUM INPUT	100 millivolts AC 400 volts DC
MAXIMUM OUTPUT	10 volts RMS or 0.5 ma 5 cps to 100 kcs

INPUT IMPEDANCE
8 megohms shunted by 30μμf
OUTPUT IMPEDANCE
600 ohms in series with 20μf
POWER REQUIREMENTS
225 volts DC, @ 3.5 ma
12.6 volts DC @ 0.3 amperes
DIMENSIONS 5″ x 7″ x 5″
WEIGHT 3.5 pounds
EQUIVALENT INPUT NOISE 1.5 microvolts RMS maximum for 10 kc bandwidth anywhere between 10 cps and 1 mcs. 4 microvolts maximum for 100 kc bandwidth
LOWER CUTOFF FREQUENCY 1 cps, 10 cps and 100 cps selectable ±20%
UPPER CUTOFF FREQUENCY 10 kcs, 100 kcs and 1 mcs selectable ±20%
DISTORTION Less than 0.5% at 10 volts output, open circuit; 3 volts into 10,000 ohm load; or 1 volt into 1000 ohm load; 10 cps to 100,000 cps

The Model 108 Quiet Amplifier reduces circuit noise to a new low. Extreme care in the choice of components and circuitry has resulted in an exceptionally low noise figure throughout the entire operating spectrum. Selectable low frequency and high frequency cutoffs are provided to further reduce the noise for limited bandwidth applications. Its usefulness however, is not restricted to the microvolt region since a maximum output of 10 volts RMS makes the instrument suitable for high level measurements.

The instrument is self contained with the exception of the power supply. This has been purposely designed as a separate package (PS-108) to avoid the problem of power line fields in the vicinity of low level circuits.

TRANSISTOR DECADE AMPLIFIER Model 40-A1

The Model 40-A1 Transistor Decade Amplifier is a low noise, general purpose, laboratory instrument which readily lends itself to a wide variety of fixed or portable applications. Although the amplifier is transistorized, a vacuum tube is employed at the input portion of the circuit. This design produces two principal advantages: a predominantly higher input impedance, particularly at the higher frequencies; and the amplifier noise figure is completely independent of the magnitude of the source impedance. To further guarantee low noise operation, the input stage has been mechanically isolated from the instrument, reducing the possibility of microphonics.

VOLTAGE GAIN	X1, X10 and X100
FREQUENCY RESPONSE	+0.2db, 10 cps to 300,000 cps ±0.5db, 5 cps to 500,000 cps −3db at 2 cps and 1,000,000 cps
BAND SELECTION	2 cps to 10,000 ±10% cps 2 cps to 100,000 ±10% cps 2 cps to 1,000,000 cps
INPUT IMPEDANCE	10 megohms shunted by 15μμf
OUTPUT IMPEDANCE	600 ohms in series with 150μf
MAXIMUM INPUT	30 millivolts for X100 gain 300 millivolts for X10 gain 400 volts DC
MAXIMUM OUTPUT	3 volts RMS or ½ milliwatt
DISTORTION	0.2% or 1 volt RMS into 10,000 ohm load; 1% at 0.5 volt RMS into 600 ohm load
NOISE*	X100 Gain 4μv max., 10 cps to 10,000 cps 7μv max., 10 cps to 100,000 cps 30μv max., 10 cps to 1,000,000 cps X10 Gain 13μv max., 10 cps to 10,000 cps 20μv max., 10 cps to 100,000 cps 65μv max., 10 cps to 1,000,000 cps *Broadband RMS values referred to SHORTED INPUT TERMINALS
TIME STABILITY	−0.5db gain change, 2 cps to 200,000 cps throughout life of batteries; −3db change at 1,000,000 cps
BATTERY LIFE	800 hours continuous operation

For full specifications on the complete line of Electrical/Electronic Test, Measuring & Control Instruments, see your local Industrial Instruments Sales Representative or write direct. We also invite your inquiry on our line of electrolytic Conductivity Equipment and Therma Bridge Gas Analyzers.

Industrial Instruments INC.
89 Commerce Road, Cedar Grove, Essex County, N. J.
® Phone: 201 CEnter 9-6200

Industrial Instruments INC.

AUTOMATIC TEST EQUIPMENT

COMPLETE ELECTRONIC/MECHANICAL SYSTEMS

For more than two decades Industrial Instruments Inc., has been privileged to work with manufacturers and users of electronic components in the design and manufacture of equipment to meet a variety of testing and inspection requirements. Complete electronic/mechanical systems have evolved as a result of this experience, and are now offered as standard units. Designs are thoroughly proven by actual operation. Automatic testers generally consist of: (1) the electrical and electronic circuitry required to perform the measurement involved; (2) mechanical handling of the components to bring them to the test station, and to properly dispose of the tested components. Industrial Instruments has the engineering talent and manufacturing facilities experienced in the design and building of complete electronic/mechanical systems. We therefore can offer singular responsibility to customers for the proper performance and operation of the equipment.

AUTO-BRIDGES

MODEL AB-5-1
MEGACYCLE BRIDGE

Range	Accuracy
0-50 pf 50-1000 pf	±0.2 pf or 0.1 pf* ±1% or 0.5%*

Speed of operation — limited only by operator.

Feasible test rates 1500-2000 pieces/hour.

5,000 pieces/hour attainable with automatic handling.

*With special calibration only — available at extra cost.

The Auto-Bridge is high-speed test equipment designed for go-no-go testing with high accuracy. It is very useful as an incoming inspection tool for component users. It is also used as a final inspection device by component manufacturers.

MODEL AB-3-5 IKC BRIDGE

	Range	Accuracy
Cap. Res. or Imp.	100pf-15μf 10 Ohms-5 Megohms	±0.3% ±0.3%

Depending on operator, 1500 pieces per hour would be a practical speed. Instrument capable several times this figure.

MODEL AB-4-4 DC BRIDGE

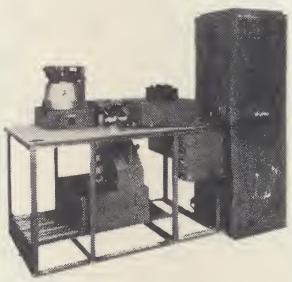
Resistance Range	Accuracy
10 ohms to 100 ohms	±0.3%
100 ohms to 2 Megohms	±0.1%
2 Megohms to 10 Megohms	±0.2%
10 Megohms to 100 Megohms	±0.3%

Speed of operation limited only by operator. 1500 to 2000 pph possible.

BASIC SORTERS Model AB-1-8A — 9 Group

The Model AB-1-8A shown is designed for the basic sort operation in the production of film-type resistors. Unleaded cores are grouped according to resistance value. This facilitates set-up of the helixing operation which follows.

This equipment utilizes the 1 KC Auto-Bridge. It provides for 8 limits and sorts into nine categories. Electronic memory enables simultaneous testing and sorting to achieve high test rates. Manually reset counters are provided for each bin.



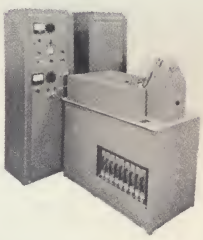
Range	Accuracy
10 ohms to 1 Meg.	±0.3%

Speed of operation: 4000 pieces per hour

Model AB-7-1 — 27 Group

Model AB-7-1 performs the same type function as the Model AB-1-8A. Additional sorting capability is provided however to permit 27-group sorting at rates exceeding 2000 pieces per hour.

CAPACITOR SORTER-LEAKAGE TESTER
Model AB-8-1

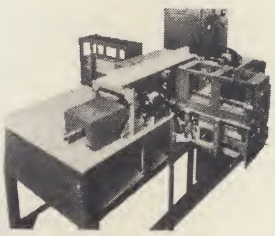


Model AB-8-1 Auto-Bridges provides rapid and accurate sorting of capacitors for both value and DC leakage. It is useful in both final test and incoming inspection operations.

For capacity measuring the 1KC Auto-Bridge is used with multiple ratio switching. Three power supplies are incoporated in the leakage tester One is used for initial charge to a pre-set voltage within the range of 0 to 3000 volts. This supply is current-limited in order not to damage the capacitors. The other two supplies are highly regulated and are used as a stable reference for the leakage measurements. A leakage-current detector and memory facility are also included Operates at 2200 pieces per hour.

Range	Accuracy
100 pf to 15 μf	±0.3%

HELIXING LATHES
Model ABL-DC-8



Standard models for accommodating unleaded or leaded cores • Infinite pitch adjustment • High production rate • Complete automatic operation.

Cuts helical path on film resistors to provide desired final resistance value. Used with metal, carbide, and oxide film types on glass or ceramic cores.

Cores may be handled either with or without leads as required.

Resistance of the piece is continuously monitored during the helixing operation. Monitoring equipment (Controller) utilizes the basic Auto-Bridge circuitry, providing in this application automatic termination of the helix. A choice of Controllers is available; either one can be selected for use with the above lathes.

RESISTOR SORTER — 3 GROUP Model AB-4-6

The Model AB-4-6 is a high-speed unit designed for use as a final tester by resistor manufacturers. It is also useful for incoming inspection operations.

This sorter utilizes the DC Auto-Bridge as the measuring instrument. Memory facility is incorporated to enable simultaneous testing and sorting which effectively doubles the test rate capability. Timing of the bridge is synchronized with the automatic feed system.

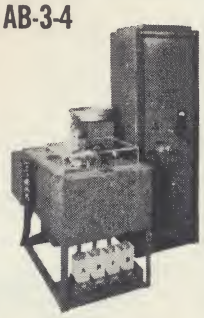
Resistance Range	Accuracy
10 ohms to 100 ohms	±0.3%
100 ohms to 2 Megohms	±0.1%
2 Megohms to 10 Megohms	±0.2%
10 Megohms to 100 Megohms	±0.3%

DISC-CAPACITOR TESTER Model AB-3-4

Model AB-3-4 is a high-speed unit designed for testing disc capacitors before lead attachment.

The capacitance measurement is made by the 1 KC Auto-Bridge incorporating two limit arms for discrimination into three groups. Three counters are provided, one for low pieces, one for good, and one for a total count.

The high-voltage tester is adjustable in the range of 0 to 1000 volts by means of a panel control. A voltmeter is incorporated for reading test voltage.



Testing rate — 5000 pieces per hour.

Disc size accommodation: Thickness .020 to .125". Diameter .100 to 1.000". Capacitance sorting capability:

Range	Accuracy
100 pf-15 μf	±0.3%

The systems shown on this page are typical of those currently in use at some of the leading component manufacturing and user plants in the country. Our Engineering Department will be glad to study your specific requirements. Write today for a copy of our catalog describing our standard units.

Industrial Instruments INC.
89 Commerce Road, Cedar Grove, Essex County, N. J.
Phone: 201 CEnter 9-6200

Industrial Instruments INC.

PRICE SHEET

TEST AND MEASURING INSTRUMENTS

RESISTANCE DECADES	
DR-1D	$ 78.00
DR-2D	67.00
DR-3D	65.00
DR-4D	65.00
DR-50D	95.00
DR-51D	100.00
DR-52D	112.00
DR-70D	165.50
DR-71D	215.25
CAPACITANCE DECADES	
DK-2A	$175.00
DK-4	80.00
DK-5A	95.00
DK-10	95.00
DK-11A	185.00
RESISTANCE CALIBRATOR	
CR-10M	$365.00
CR-100M	760.00
CR-1000M	648.00
RESISTOR STANDARDS	
SR-1	$ 55.00
SR-10	50.00
SR-100	50.00
SR-1,000	50.00
SR-10,000	55.00
IMPEDANCE BRIDGE	
ZB-2	$485.00
LOW RESISTANCE OHMMETER	
LRO-1	$148.85
DIGITAL VOLTMETER	
DVM-2	$1,550.00
DIGITAL SCANNER	
DS-100	P.O.R.*
DS-1,000	P.O.R.*
DS-10,000	P.O.R.*
WHEATSTONE BRIDGES	
RN-1	$ 176.50
RN-2	193.25
RN-3	226.00
DEVIATION BRIDGE	
DB-1	$ 880.00
KILOVOLTMETERS	
Model 60	$ 350.00
Model 50	400.00
Model 40 Divider	1,850.00

* Price on Request

INSULATION TEST EQUIPMENT

Megohmmeters			
L-2A	$175.00	L-6B	$310.00
L-4A	215.00	L-7	383.00
Dissipation Factor & Capacitance Standard			
CPF-1		$248.00	
Compliant Electrode			
SVR-1		$450.00	
Voltage Breakdown Testers			
P1	$218.00	P3B	$ 488.00
P2	264.00	P-7-20	1,029.00
Tracking & Erosion Resistance Test Set			
TERT-1		Price on Request	
Dielectric Breakdown Tester			
PDA-1		$6,500.00	

Insulation Test Sets	AC	DC	AC/DC
3000	$165.00		$250.00
3010	250.00		400.00
3050	500.00		650.00
3100	700.00		1,100.00
5000	175.00		300.00
1000	250.00		375.00
1500-AC	285.00		
2500-AC	400.00		
2500-DC		$420.00	
4000-DC		600.00	

High Voltage Connectors and Switches			
C-1	$10.00	D	20.00
C-0	5.00	E	22.00
A	20.00	F	24.00
B	22.00	G	26.00
C	25.00		

Portable H.V. D.C. Power Supply	R.F.	1MA	5MA
6000-1		$160.00	$200.00
6000	$145.00	175.00	225.00
6005	150.00	200.00	250.00
6010	155.00	225.00	275.00
6015	160.00	250.00	300.00
6025	215.00	275.00	350.00

Mirror Scale Option — Add $50.00
Current Meter Option — Add $50.00

HIGH VOLTAGE POWER SUPPLIES

Heavy Duty Power Supply	
F-100V	$ 650.00
F-500V	800.00
F-6001	975.00
F-6002	985.00
F-6003-AI	375.00
F-6003-AV	550.00
F-6003-AK	1,100.00
F-6005-AI-H	550.00
F-6005-AV	775.00
F-6005-AIK	1,200.00
F-6010-AI	800.00
F-6010-AV	3,000.00
F-6020-A05	975.00
F-6030-A3	5,000.00
F-6050-T	600.00
F-6100-T	1,100.00
3 Phase Heavy Duty Power Supply	
A 1-A	$ 2,000.00
A 1-B	12,500.00
A 10A	2,500.00
A 10B	3,700.00
A 30A	4,500.00
A 31	6,750.00
A 32	7,850.00
A 50	5,900.00
A 51	8,350.00
A 72	9,250.00
A 100	10,250.00
A 110	14,575.00
A 200	16,450.00
A 300	19,200.00
A 500	27,500.00
Constant Current Supplies	
C-25-100	$ 980.00
C-70-70	1,700.00
C-500-10	1,700.00
C-Dual-500-10	2,750.00
C-1000-5	3,000.00
C-3000-1	2,500.00
C-5000-1	3,450.00
C-10K-5H	3,850.00

AMPLIFIERS

8 Channel Transistor Amplifier	
48	$ 985.00
Transistor Amplifier	
45	195.00
Quiet Amplifier	
108	135.00
PS-108	85.00
Transistor Decade Amplifier	
40-AI	225

INSULATION TEST EQUIPMENT

A.C. BREAKDOWN TESTER	
PA-5-152	$1,150.00
PA-5-155	1,400.00
PA-5-252	1,250.00
PA-5-255	1,550.00
PA-5-502	1,350.00
PA-5-505	1,650.00
PA-50-1005	3,950.00
PA-5-252/052	1,600.00
PA-5-502/102	1,700.00
PA-50-5010/ 1510/510	7,500.00
ARC RESISTANCE TESTER	
ART-1	$1,515.00
ART-2	3,940.00
HIGH VOLTAGE SCHERING BRIDGE	
PS-1GP	$5,675.00
PS-1C	2,700.00
DIELECTRIC TESTER	
DT-1	P.O.R.*
CABLE FAULT FINDER	
PDI-15	P.O.R.*
PDR-1	P.O.R.*

* Price on Request

HIGH VOLTAGE POWER SUPPLIES

Packaged H.V. Power Supplies	
15-0-15-500MA	$ 50.00
30-0-30-100MA	50.00
05-KV-5MA	50.00
1-KV-5MA	60.00
2-KV-5MA	70.00
3-KV-5MA	80.00
5-KV-5MA	95.00
7.5-KV-5MA	110.00
10-KV-5MA	125.00
15-KV-5MA	140.00
20-KV-5MA	235.00
30-KV-5MA	300.00
50-KV-5MA	600.00
75-KV-5MA	750.00
100-KV-5MA	1,100.00

VOLT BOXES

VZA-1	$ 54.00	VZA-1K	$ 85.00
VZA-5	54.00	VZA-2K	100.00
VZA-10	54.00	VZA-4K	110.00
VZA-100	63.00	VZA-5K	125.00

AUTOMATIC TEST EQUIPMENT

Auto Bridges	
AB-3-5	$ 820.00
AB-4-4	3,620.00
AB-5-1	3,750.00
Capacitance Sorter-Leakage Tester	
AB-8-1	18,000.00
Resistor Sorter	
AB-4-6	10,200.00
Basic Sorters	
AB-1-8A	11,700.00
AB-7-1	16,800.00
Helixing Lathe	
HBL-DC-8	19,950.00
Disc Capacitor Tester	
AB-3-4	13,500.00

ALL PRICES F.O.B. CEDAR GROVE, N.J. AND ARE SUBJECT TO CHANGE WITHOUT NOTICE

Industrial Instruments INC.

SALES REPRESENTATIVES OFFICES

ALABAMA, Huntsville
Gentry Associates, Inc.
205-534-9771

ARIZONA, Phoenix
Williams & Associates, Inc.
602-254-6085

CALIFORNIA, Inglewood
WELCO INC.
213-674-7232

CALIFORNIA, Palo Alto
WELCO INC.
415-321-8500

COLORADO, Denver
Williams & Associates, Inc.
303-388-4391

CONNECTICUT, W. Hartford
Industrial Instruments, Inc.
203-233-3250

FLORIDA, Orlando
Gentry Associates, Inc.
305-424-0730

FLORIDA, St. Petersburg
Gentry Associates, Inc.
813-867-7820

ILLINOIS, Chicago
Kenneth W. Meyers Company
312-774-6440

LOUISIANA, New Orleans
IBL Engineering & Sales, Inc.
504-895-4793

MARYLAND, Rockville
Gawler-Knoop Company
301-427-3950

MARYLAND, Towson
Gawler-Knoop Company
Dial 0 — ENterprise 5-3151

MICHIGAN, Detroit
Kurt J. Lesker Company
313-542-9338

MINNESOTA, St. Paul
Engineering Products Associates
612-698-5531

MISSOURI, St. Louis
D. Donald Associates
314-367-8600

NEW JERSEY, Roseland
Gawler-Knoop Company
201-226-4545

NEW MEXICO, Albuquerque
Williams & Associates, Inc.
505-255-1638

NEW YORK, Rochester
Ossmann Instruments, Inc.
716-586-0380

NEW YORK, Syracuse
Ossmann Instruments, Inc.
315-477-1162

NEW YORK, Vestal
Ossmann Instruments, Inc.
607-785-9947

OHIO, Cleveland
Kurt J. Lesker Company
216-382-6170

OHIO, Columbus
Kurt J. Lesker Company
614-488-2995

OKLAHOMA, Tulsa
IBL Engineering & Sales, Inc.
918-936-6305

OREGON, Portland
Fryer and Company, Inc.
503-226-3733

PENNSYLVANIA, Pittsburgh
Kurt J. Lesker Company
412-892-2996

PENNSYLVANIA, Richboro
Gawler-Knoop Company
215-925-7550

TEXAS, Austin
IBL Engineering & Sales, Inc.
512-452-2064

TEXAS, Dallas
IBL Engineering & Sales, Inc.
214-363-2921

TEXAS, Houston
IBL Engineering & Sales, Inc.
713-523-8360

UTAH, Salt Lake City
Williams & Associates, Inc.
801-466-8709

WASHINGTON, Seattle
Fryer and Company, Inc.
206-363-7655

WEST VIRGINIA, Charleston
Kurt J. Lesker Company
304-768-8846

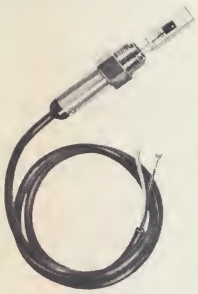
CANADA
Ontario, Toronto
Lisle Instrument Systems, Ltd.
416-635-0131
Quebec, Montreal, St. Laurent
Lisle Instrument Systems, Ltd.
514-744-4943

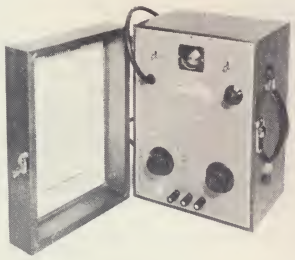
EXPORT
New York City, New York
Industrial Instruments, Inc.
International Division
212-986-2244

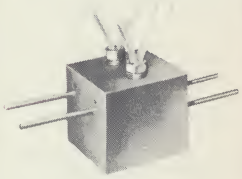
FACTORY AND MAIN OFFICES
Industrial Instruments, Inc.
89 Commerce Road
Cedar Grove, New Jersey 07009
201-239-6200
TWX: 201-239-4704
CABLE: SOLUBRIDGE CEDARGROVENJ

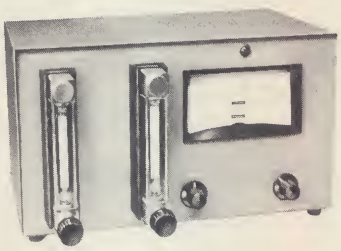
OTHER PRODUCTS MANUFACTURED
BY INDUSTRIAL INSTRUMENTS INC.

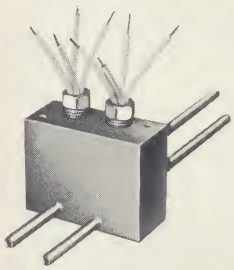
ELECTROLYTIC CONDUCTIVITY EQUIPMENT . . .
The world's broadest line of instrumentation for measurement and control of electrolytic conductivity in industry, laboratory, field measurements, oceanography, marine applications, and agriculture. Industrial Instruments' equipment is providing quick, reliable and inexpensive answers to many process control problems. A wide range of cells are available to meet every application requirement.





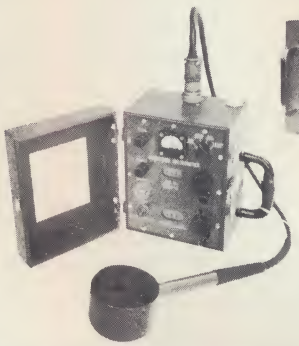


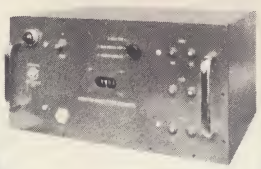


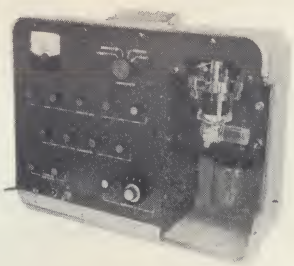


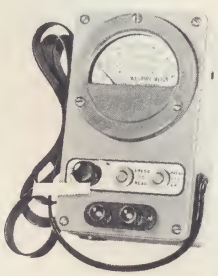
GAS ANALYSIS INSTRUMENTS & COMPONENTS
. . . for monitoring gas stream purity values, leak detection and general thermal conductivity applications. Ultra-sensitive detectors for gas chromatography measurements, Analyzers, power supplies and associated components for application in the measurement of acetone in air, air in helium, argon or helium in air, carbon dioxide in air, hydrocarbons in air, hydrogen in methane, etc.

OCEANOGRAPHIC INSTRUMENTS
. . . portable Electrodeless Induction Salinometers for measuring salinity, temperature, conductivity and depth in situ and of samples. The electrodeless inductive conductivity cell permits "in-the-field" measurements by unskilled personnel and frees conductometric analysis from the laboratory. Equipment is sturdily constructed and features stable, solid - state electronics for maintenance free operation.









SOIL MOISTURE MEASUREMENT EQUIPMENT . . .
Specialized, proven equipment designed for the measurement of moisture and soluble salts or fertilizer content in a wide variety of agricultural applications. Specially designed meters, bridges and soil blocks as well as soil test kits have eliminated guesswork in irrigation and soil fertility.

Industrial ®
Instruments

Industrial Instruments INC.

89 COMMERCE ROAD, CEDAR GROVE, NEW JERSEY 07009
201 CEnter 9-6200 TWX: 201 239-4704

Part No. 32311D Printed in U.S.A.

Effective July 1, 1964

Industrial Instruments INC.
89 COMMERCE ROAD
CEDAR GROVE, N. J., U.S.A.

PRECISE MEASUREMENTS DIVISION PRICE SCHEDULE

PACKAGED POWER SUPPLIES

Model No.	Price
15-0-15-500 MA	$ 50.00
30-0-30-100 MA	50.00
05-KV-5 MA	50.00
1-KV-5 MA	60.00
2-KV-5 MA	70.00
3-KV-5 MA	80.00
5-KV-5 MA	95.00
7.5-KV-5 MA	110.00
10-KV-5 MA	125.00
15-KV-5 MA	140.00
20-KV-5 MA	235.00
30-KV-5 MA	300.00
50-KV-5 MA	600.00
75-KV-5 MA	750.00
100-KV-5 MA	1100.00

VOLT BOXES

VZA-1	$ 54.00
VZA-5	54.00
VZA-10	54.00
VZA-100	63.00
VZA-1K	85.00
VZA-2K	100.00
VZA-4K	110.00
VZA-5K	125.00

HIGH VOLTAGE ZENER REGULATORS

ZA-1K	$50.00
ZA-2K	55.00
ZA-3K	60.00
ZA-4K	70.00

HIGH VOLTAGE DC POWER SUPPLIES

	RF	1 MA	5 MA
6000-1		$160.00	$200.00
6000	$145.00	175.00	225.00
6005	150.00	200.00	250.00
6010	155.00	225.00	275.00
6015	160.00	250.00	300.00
6025	215.00	275.00	350.00

Mirror Scale Option — Add $50.00
Current Meter Option — Add $50.00

INSULATION TEST SETS

	AC	DC	AC and DC
3000	$165.00	———	$250.00
3010	250.00	———	400.00
3050	500.00	———	650.00
3100	700.00	———	1100.00
5000	175.00	———	300.00
1000	250.00	———	375.00
1500-AC	285.00	———	———
2500-AC	400.00	———	———
2500-DC	———	420.00	———
4000-DC	———	600.00	———

KILO VOLTMETERS

50-AC/DC	$ 400.00
60-DC	350.00
Model 40 Divider	1850.00

HIGH VOLTAGE CONNECTORS

Model No.	Price
C-0	$ 5.00
C-1	10.00

Quantity Prices Available on Request

HIGH VOLTAGE SWITCHES

A	$20.00
B	22.00
C	25.00
D	20.00
E	22.00
F	24.00
G	26.00

Quantity Prices Available on Request

HEAVY DUTY POWER SUPPLIES

F-100V	$ 650.00▲
F-500V	800.00▲
F-6001	975.00*
F-6002	985.00*
F-6003-A1	375.00*
F-6003-AV	550.00*
F-6003-AK	1100.00*
F-6005-A1-H	550.00*
F-6005-AV	775.00*
F-6005-A1K	1200.00*
F-6010-A1	800.00*
F-6010-AV	3000.00*
F-6020-A05	975.00*
F-6030-A3	5000.00*
F-6050-T	600.00
F-6100-T	1100.00

▲ Isolated; Either side may be grounded.
*Not isolated; output reversing feature at $50.00 add.

3 PHASE HEAVY DUTY POWER SUPPLIES

A1-A	$2000.00
A1-B	12500.00
A10A	2500.00
A10B	3700.00
A30A	4500.00
A31	6750.00
A32	7850.00
A50	5900.00
A51	8350.00
A72	9250.00
A100	10250.00
A110	14575.00
A200	16450.00
A300	19200.00
A500	27500.00

CONSTANT CURRENT POWER SUPPLIES

C-25-100	$ 980.00
C-70-70	1700.00
C-500-10	1700.00
C-Dual-500-10	2750.00
C-1000-5	3000.00
C-3000-1	2500.00
C-5000-1	3450.00
C-10K-5H	3850.00

PRICES LISTED ARE F.O.B. CEDAR GROVE, N.J. AND SUBJECT TO CHANGE WITHOUT NOTICE.

Part No. 30889D

Printed in U.S.A.

We are pleased to enclose the literature you requested.

Pkg. P.S. SF28 #30744D 30889D

EP 1/7/66

Our representative in your area is:

Please contact our Cedar Grove office.
201-239-6200

Beckman

We are pleased to announce . . .

On December 2, 1965, Industrial Instruments, Inc., became the Cedar Grove Operations of Beckman Instruments, Inc.

Please address all communications to:

Beckman Instruments, Inc.
Cedar Grove Operations
89 Commerce Road
Cedar Grove, Essex County, New Jersey 07009

you further?

☐ PLEASE PLACE MY NAME ON YOUR TECHNICAL MAILING LIST.

☐ MY FIELD OF INTEREST IS _____

_____

_____

T. Nelso Systems Consultant
Box 1546
Poughkeepsie, N.Y. 12603

☐ MY NAME AND ADDRESS ARE CORRECT AS SHOWN.

☐ PLEASE NOTE CORRECTION ABOVE

PRINTED IN U.S.A.

POSTAGE
WILL BE
PAID BY
ADDRESSEE

FIRST CLASS
Permit No. 18
CEDAR GROVE,
NEW JERSEY

BUSINESS REPLY CARD

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

Industrial Instruments INC.

89 COMMERCE ROAD

CEDAR GROVE, ESSEX COUNTY, 07009

NEW JERSEY, U. S. A.

Part. 19708D